

XII. *A Revision of the Genus Erebia.* By HENRY JOHN ELWES, F.R.S., F.L.S., &c.

[Read February 16th, 1898.]

It is now nine years since I published some notes on this genus in the Transactions of this Society, 1889, p. 317, and gave a synopsis of the species then known to me. My attention was last year again strongly attracted to the genus by a paper by Herr H. Calberla (Iris, ix, p. 377) on *Erebia glacialis* and *E. melas*, in which he proved by a comparison of the genitalia of the male insects that the form which had been taken at Campiglio in South Tyrol by Mrs. Nicholl, myself and others, and which I had considered to be the missing geographical link uniting *E. melas* of Hungary with its supposed Pyrenean form *E. lefebvrei* was nothing more than a strongly-marked local variety of *E. glacialis*, which occurs as a rare aberration in some other places. I at once asked Mr. Edwards to employ his leisure in the dissection and examination of the genitalia of the other species of the genus, from which I expected that much help might be derived in the classification of what has always been a difficult genus, on account of its wide diffusion and great tendency to vary; and finding later that Dr. Chapman was working at the same subject, I placed Mr. Edwards's dissections at his disposal.

The result of their work has in some cases confirmed and in others modified the views which I previously held as to the specific value of characters, which are in some cases extremely variable; but as my knowledge of the genus has increased, I am rarely unable to name the most aberrant specimens without having recourse to the form of the clasps which, as Dr. Chapman's investigations show, are in most cases a certain guide to the identification of species, if sufficient study be given to them.

That this genus is one in which no one should be too confident about specific affinities without some other guide than colour and markings is well shown by the mistake I made about *E. glacialis*, and by an even more remarkable

slip which Dr. Staudinger recently made, in describing and figuring as a new variety of *Erebia ncrine* what he afterwards admitted to be nothing more than an ordinary *E. pronoe*. Therefore, though I have done my best to form a correct judgment from all accessible sources of information, it is probable I have not even now placed in their correct order some of the least known species of *Erebia*.

My thanks are due to many entomologists for the assistance they have given me in lending rare species of *Erebia* from their collections, especially to the Grand Duke Nicholas Mikhailovitch and his most obliging assistant M. Serge Alphéraky, who have added many rare Siberian species to my collection and lent many others for examination; to Prof. Aurivillius of Stockholm, who lent me some types from the Stockholm Museum; to Dr. Staudinger, to M. Charles Oberthür, to Dr. Chapman, Messrs. Leech, Tutt, Nicholson and others. I am sure that entomologists will also thank Sir W. Flower of the British Museum as heartily as I do for allowing the national collection of this genus, which had remained much as I found it nine years ago, to be properly arranged under the names which I have adopted in this paper, and though it is still wanting in a few of the rarer Asiatic species, yet by the incorporation of the Frey and Godman-Salvin collections it now contains a very good series of nearly all the European species.

The variation in the majority of the species of this genus is so great, that in many cases it is very difficult and in others impossible to draw up descriptions or analytical tables which will enable a person who has not a good knowledge of them to identify them. Staudinger remarks in his paper on the Lepidoptera of Greece as follows:—“When we consider how exceptionally great are the variations of the genus *Erebia* both as regards the presence or absence of the ocelli, the red bands or spots, the darker or lighter underside, &c., not only as local variations, but also as aberrations, we find a very rich material in proof of the Darwinian theory; and the more material we receive, so much more uncertain we are about the specific distinction of many forms which we now look on as good species.”

This is as true now as when it was written nearly thirty years ago, so it has therefore been a great advantage to have the additional test of the genitalia to apply before attempt-

ing to decide many difficult points of this character. We have found that in most cases when one knows them well enough they confirm the ideas we had arrived at from other considerations, and only exceptionally do difficulties arise as to the relationship of the species.

With regard to the question of nomenclature I adhere to the views that I have often expressed, which are: that as it is in many cases impossible to be absolutely certain about the species described by old authors, who often, indeed I may say usually, were most imperfectly acquainted with the species they attempted to describe, it is far better to use a name which has been generally accepted and adopted by modern naturalists and writers, than to try to apply too strictly the laws of priority. Since I last wrote, the trinomial system, which has been adopted by many ornithologists, has been introduced by Mr. Rothschild in his revision of the Eastern Papilionidæ. It is no doubt necessary to have some lower grade of definition than what I consider specific, and the number of named varieties which have been described, but which are seldom capable of exact definition, has among the Palearctic Lepidoptera assumed alarming proportions; but if in such a case, as for instance, *E. alecto*, Hübn., or *E. cæcilia*, Hübn., we adopt the trinomial system, we lose sight of the facts which have been so clearly pointed out by Staudinger on p. xxiii. of the introduction to his Catalogue, that there are several kinds of varieties, namely, local varieties, more or less constant, which he defines by the prefix of "var."; accidental varieties or aberrations, which he defines by the prefix of "ab."; and seasonal varieties or generations which he defines by the prefix of "gen. i." or "gen. ii." as the case may be. Now if I write *E. glacialis alecto*, Hübn., I obscure the true facts, because Hübner was not the author of *glacialis*, and his *alecto* is in some districts of the Alps a local variety, and in others according to Calberla an aberration only. *E. manto* var. *cæcilia*, Hübn., which in the Alps is a rare aberration, in the Pyrenees is a constant variety, and if I could be sure that the typical *manto* did not also occur in the Pyrenees, I would treat it as a good species and give it a new name, as I have never seen an Alpine specimen which is exactly like it.

Therefore however suitable and justifiable the trinomial plan may be in ornithology, I do not think it is applicable

to Lepidoptera, but am of opinion that to carry the naming of varieties to the point which many continental writers have done, is not justifiable. The larger the number of specimens which are brought together from many localities the more difficult it becomes to recognise these varieties, and I have therefore dropped the names of a few which I had previously adopted, though I have not done so in cases where, as with many of the Asiatic forms, my knowledge is as yet insufficient to justify this course.

As however I do not expect every one to take the same views as myself, I have in arranging the British Museum series placed the varietal name on one side of all those specimens which seem to belong to them, so that every one may be able to judge for themselves whether to retain or to drop the varietal name.

I have added a table giving the geographical distribution of the genus so far as known, which shows among other things that there are apparently 3 great centres of distribution. The first is the Alps of Europe, which is undoubtedly the metropolis of the genus, no less than 26 species being found here, of which 22 occur in the Western, 22 in the Central, and 19 or 20 in the Eastern Alps, many of them being peculiar. Of these 13 or 14 extend their range to the Pyrenees, which in addition have developed 2 peculiar species, *E. lefebvrei*, and *E. gorgone*. Spain has one, namely, *E. zapateri*, and a well marked local variety of *E. tyndarus*. The Apennines have as many as 11 or 12 *Erebias*, but no peculiar species or local varieties. The Carpathians also have 12 or 13, none of which is peculiar. In the mountains of the Balkan peninsula, of which however we know but little, there are only 6, of which none is peculiar; but one, a variety of *E. afra*, is found on the coast of Dalmatia completely isolated from all its nearest allies, which are Asiatic.

In the Caucasus and Armenia we know only 6 species, of which *E. hewitsoni* alone is peculiar and that a low country and not an alpine species. Considering the great extent and isolation of this high mountain range which seems admirably suited to the habits of the genus, it is a most remarkable fact that not a single endemic alpine form has been developed therein. In Scandinavia and North Russia 5 species only occur of which *E. disa* alone is peculiar, though a form of it is found in Siberia and another in the Rocky Mountains of British N. America.

In the Ural again we have but 5 species, one or two of which are Asiatic, whereas several European ones which occur in the Altai mountains are unknown. But when we come to the great mountain ranges of Turkestan and Southern Siberia, we at once meet with a number of new forms, most of which are by their outward appearance, as well as by their clasp-forms, distantly related to the species of the European Alps.

In the Western Altai, from the little we know, the majority of the Lepidoptera appear to be of European character; but southwards in the great Thianshan range and in Turkestan, especially in the Pamir and Hindu-kush ranges, we have a group which seems more nearly allied to the Himalayan and Chinese genus *Callerebia*, some of which have been separated by Moore under the generic name of *Paralasa*. I am not yet prepared to say how far generic division can be properly carried, but if *Paralasa* proves, as I anticipate, to be a good genus we shall probably have to include in it not only *mani* with its forms *jordana* and *roxane*, but also *E. parmenio*, *myops*, *maracandica*, *radians*, *kalmuka*, *hades*, and *tristis*, all of which have a differently formed hindwing and a venation differing slightly from the European *Erebias*. One may say that the European species as a rule form a very homogeneous genus but that the Asiatic ones do not; and if the subdivision of the genus is commenced, I believe that logically we should have to separate some other Asiatic and American species which I have now included. In the mountains of Transbaikalia and in the mountains which divide Central Siberia from Mongolia, at present very little explored, we seem to have a third centre of distribution, no less than 18 species being known to occur therein. Some of these, such as *E. kefersteini*, *medusa*, *ligea* and *tyndarus*, are European or very nearly allied to European forms, others, such as *E. parmenio*, *cyclopius*, *dabanensis* and *theano* with its forms, are typically Asiatic; and some, such as *E. rossi*, *edda*, and *erinna*, are Arctic and N.-W. American in their affinity, so far as I can judge from the very slight knowledge of them which I possess. In Tibet we have but one species, *E. alemene*, which is of European type, the few others which occur there being *Callerebias*; and in Japan only *E. sedakovi*, which is also found in Amurland.

This shows that the genus *Erebia* is characteristic of the

Western Palearctic region only, the Eastern species being nearly all aberrant.

In America we have in all 8 species, of which 6 are found in the Rocky Mountains. Of these *E. tyndarus* is inseparable from the European species even as a variety. *E. epipsodea* has a remarkable resemblance to the northern form of *medusa*; *E. disa* var. *maneuus* is hardly distinguishable from the Lapland insect. *E. vidleri* is so like *sedakovi* that I separate it with some doubt. *E. discoidalis* is common to Arctic America and Asia, *E. sofia* is but a variety of the Siberian *maurisius*, and *E. magdalena*, which we only know from a very restricted area in the highest mountains of Colorado, is peculiar. In Arctic America we know four species at present of which *E. rossi* and *E. discoidalis* also occur in Asia and *E. fasciata* is peculiar.

There is not a single species in Eastern America and though one or two Erebia-like insects have been discovered in Patagonia, there is in this genus nothing analogous with what we find in *Colias* and *Argynnis*, where outlying, more or less aberrant species are found in spots suitable to their habits in the Andes and Antarctic America.

#### SYNOPSIS OF THE GENUS EREBIA.

1. EPIPHRON, Knoch., Beitr., iii, p. 131, t. 6 (1783); Harz, Silesia,  
H.-S., 92-94 . . . . . Black Forest,  
Vosges.  
var. *pyrenaica*, H.-S., 535-38. . . . . Pyrenees.  
(*inconstans*, nom. *vix conservandum*; *trans.*  
*ad cassiopem*).  
var. *cassiope*, Fabr., Mant., p. 42 (1787); Alps, Pyre-  
Meyer-Dür, t. ii, 4, 5, 7 . . . . . nees, Hung.  
(*inconstans*—*formæ intermediæ adsunt*.) . . . . . mont., Scot-  
land.  
ab. *nelamus*, Bdv., Gen., p. 26 (1840); Meyer-  
Dür, t. ii, 3. . . . . Alps.  
(ab. *vix fasciata et fere ino-cellata*.)
2. MELAMPUS, Fuessly, Verz. Schw. Ins. p. 31, Alps, Switz.,  
fig. 6 (1775); Esp., 103, 1. . . . . Hung., Ital.  
var. *sudetica*, Stgr., Cat., p. 10 (1861) . . . . . Silesia mont.  
(var. *supra et subtus mac. ruf. majoribus*.)

3. KEFERSTEINI, Ev., Bull. Mosc. 1851, ii, p. 610 ;  
H.-S., 617-18 . . . . . Sib. cent. mont.
4. FLAVOFASCIATA, Heyne, Ruhl. Pal. Gross-  
schmett., p. 805 (1895) . . . . . Alps of Ticino.
5. ERIPHYLE, Frey., ii, p. 150, t. 187, 3, 4 (1836);  
Meyer-Dür, p. 154, t. ii, 8 ; cf. Roth. Mitt.  
Schw. ent. Ges., i, p. 110 (1863) ; Christ,  
*l.c.*, vi, p. 231 (1882) . . . . . Helv. mont.  
? var. *tristis*, H.-S., 387-90 (? *forma orientalis*). Alp. Tyr. et  
Austr.
6. ARETE, Fabr., Mant., 42 (1787) : Hübn., 231-32 Austr. Alp.
7. CHRISTI, Rätzer, Mitt. Schw. ent. Ges., viii, Lagunthal  
p. 220 (1890) ; Schulz, Stett. ent. Zeit., liii, *prope* Sim-  
p. 359 (1892) . . . . . plon.  
(*sp. mihi dubia an mnestræ var. vel ab. ?*)
8. MNESTRA, Hübn., 540-43 (1802) ; Esp., 120, 3, 4 Alp. Helv. et  
(*post 1802.*) . . . . . Gal.
9. PHARTE, Hübn., 491-94 (1802 ?) . . . . . Alp. Switz.,  
Austr.  
ab. vel var. *phartma*, Stgr., Iris, vii, p. 245  
(*inocellata*) . . . . . Valais Alps.
10. MAURISIUS, Esp., 113, 4, 5 ; Forts., p. 106 (1802 ?) Altai.  
*kindermanni*, Stgr., Stett. ent. Zeit., 1881,  
p. 269  
var. ? *stubbendorffi*, Mén., Bull. Acad. Petr., v,  
p. 262 (1847) . . . . . Altai.  
var. ? *pawlowskyi*, Mén., Bull. Phys. Math., Mts. of Dauria  
xvii, p. 217 ; En. iii, p. 145 . . . . . and prov.  
*herzi*, Christoph, Hor. Ent. Ross., xxiii, p. 2 Irkutsk.  
(*jule Alphéraky*) ; Stgr., Iris., vii, p. 244  
(1894)  
(*minus distincte notata supra cellam fusca,*  
*inconstans ?*)  
var. ? *haberhaueri*, Stgr., Stett. ent. Zeit., 1881. Tarbagatai,  
Alatau mont.  
var. ? vel bona sp. ? *sofia*, Streck., Bull. Brookl. Fort Churchill  
Ent. Soc., 1881, p. 35 . . . . . Hudson Bay.  
*ethela*, W. H. Edw., Can. Ent., xxiii, p. 31 Yellowstone  
(1891) . . . . . Park, U.S.A.,  
7-8,000 feet.

11. THEANO, Tausch., Mém. Mosc., i, p. 207, t. 13. Sib. centr.,  
1 (1809) . . . . . Altai.
12. MANTO, Esp., 70, 2, 3 (1781), ii, p. 106, t. 120, 1 Alps, Pyrenees,  
Hung. mont.  
ab. *cacilia*, Hübn., 213-14, Text p. 35 . . . Alps.  
(*supra fere vel rarius tota nigra.*)  
var. *constans cacilia*, Dup., i, 49, 6, 7 . . . Pyrenees.  
(♂ et ♀ *supra tota nigra*, ♀ *infra minus fusca notata.*)  
var. et ab. *pyrrhula* Frey, Lep. Schweiz, p. 37 Albula Pass,  
(1880) . . . . . Tyrol, 5—  
(var. *minor alpestris*) . . . . . 7,000 feet.  
ab. ♀ *trajanus*, Horzumaki, Schmett. Buk.,  
p. 36, ex Verh. k. k. Zool. Bot. Ges. (1897) . Carp. mont.  
(*non vidi.*)
13. CETO, Hübn., 578-9 (1803) . . . . . Alps, Hung.  
Gall. mont.
14. MEDUSA, Fabr., Mant., p. 40 (1787); Hübn., Germ. cent. et  
t. 45, 103-4 . . . . . mer., Belg.,  
var. et ab. *psodea*, Hübn., 497-99, p. 34 . Gal. or.,  
(*inconstans ocellis pluribus majoribus*) . . . Helv. ad  
4,000 ped.,  
Græcia, Cauc.  
ab. *procopiani*, Horzumaki, l. c., p. 36 (*non vidi*) Carp. mont.  
var. *hippomedusa*, Ochs., Meiss. N. Anz. Austr. et Helv.  
Schw., Nr. 12, p. 15; Meyer-Dür, p. 163 . Alp. 3,700—  
(var. *alpestris inconstans minor ocellis paucioribus minusve conspicuis, ? ad fide Meyer-Dür.*)  
var. vel bona sp. ? *polaris*, Stgr., Cat., p. 10 Lapp., Norv.  
(1861) . . . . . bor., Sib.  
(*subtus subfasciata, trans. ad sequentem.*) . . . centr. et ? bor.  
var. *uralensis*, Stgr., Cat., p. 10 (1861) . . . Ural mont.
15. CEME, Hübn., 530-33 (1803); Esp., 120, 2 . Alp, Gal.  
mont., Pyr.  
var. *spodia*, Stgr., Cat., 1871, p. 24 . . . Austr. et Styr.  
(var. *major ocellis majoribus.*) . . . mont. et Alp.
16. EPIPSODEA, Butl., Cat. Sat. B. M., p. 80, t. 2, Colorado, Mon-  
fig. 9 (1868); Edw., Butt, N. A., iii, tana, Prov.  
Erebia, iii. . . . . Alberta  
mont. et Alp,  
2-10,000 ft

- var. vel ab. *brucei*, Elw., Trans. Ent. Soc. Lond., Summit county,  
1889, p. 326; Edw. *l. c.* . . . . . Col., 12,000  
(var. *minor ocellata*) . . . . . ft.
17. MELAS, Herbst, 210, 4-7, viii, p. 191 (1796) . Hung. mer.  
mont.  
*maurus*, Esp., 107, 3, 4 (1798?) . . . . . Græcia mer.  
mont.,? Dalm.
18. LEFEBVREI, Dup. t. xxxv, 3, 4, ♂; ? Bdv. Ind., Pyr. cent., 6—  
p. 23 (1829) . . . . . 8,000 ft.  
var. *pyrenæa*, Ob. Et. Ent., viii, p. 22; Godt., Pyr. or., 7—  
ii, t. xvii, 1, 2, ♂ . . . . . 9,000 ft.  
(*minor minus ocellata*.)  
var. ? *astur*, Ob. l. c., p. 22, t. 1, 12, ♀ . . . Asturiamont.,  
6—8,000 ft.
19. STYGNE, Ochs, i, 1,276 (1807); H.-S., 90, 91, ♀ Germ. mer. et  
Gal. mer.  
mont., Pyr.,  
Cauc. (*non*  
*vidi*).  
ab. vel var. ? *valesiaca*, ♂ *fere vel tota nigra*  
*vix fasciata* ♂ et ♀ *minus ocellata* . . . Valais Alp.
20. NERINE, Freyer, 13, 3, 4 (1831); Stgr., Iris., viii, Helv. mer. or.  
p. 285 . . . . . et Tyrol. mer.  
mont., 1—  
5,000 ped.  
var. *reichlini*, H.-S.; cf. Stgr., *l. c.* . . . Austr. mont.  
(*obscurior minus fasciata subt. al. post.*  
*inocellata*.) (Salzburg).  
var. *inconstans* et ? ab. *morula*, Speyer, Stett. Tyrol. mer.  
ent. Zeit., 1865, p. 248 . . . . . Alp.  
(var. ? *alpestris minor, obscurior, subtus*  
*unicolor*.)
21. SCIPIO, Bdv. Ic., 30, 1-6, i, p. 152 (1832) . Gall. Alp. mer.  
or. (Briançon,  
Digne).
22. GLACIALIS, Esp., 116, 2 (ante 1800 ?); H.-S., Helv. et Austr.  
173-74 . . . . . et Ital. Alp.  
*pluto*, Esp., 121, 1; cf. Calberla, Iris, ix, pp.  
375-93, t. viii.  
var. et ab. *alecto*, Hübn., 528-29, 5 (*nec* 515-16) Tyrol. Alp. etc  
*melas-nicholli*, Ob., Ent. Mo. Mag., Jan. 1896.

23. EVIAS, Godt., Tabl., Méth., p. 21 (1822) ; Bdv. Valais, Ped., et  
Ic., 31, 3-5 . . . . . Gall. mont.,  
*bonelli*, Hübn., 892-95. . . . . Pyr., Hisp.  
centr. mont.
24. HEWITSONI, Lel., Wien. Mon., 1864, p. 167, t. 3, Georgia, Suane-  
6, 7 ; Stgr., Hor. Ent., 1870, p. 65 . . . . . tia, Persia  
bor. mont.
25. TYNDARUS, Esp., 67, 1 (1781) ; cf. Ob. Et. Ent., Helv., Austr.,  
viii, p. 25 . . . . . Pyr., It., Gall.  
et Hung.  
alp.
- callias*, W. H. Edw., Trans. Am. Ent. Soc.,  
iii, p. 274 (1871) . . . . . Colorado alp.
- ab. *cæcodromus*, Gu. et Vill., p. 87. (*absque*  
*ocellis*.)
- var. *dromus*, H.-S., 168-69, 275, vi, p. 8 ; Ob. Pyr. Cauc., It.  
Et. Ent., viii, p. 25 . . . . . mont., Arm.  
(*inconstans, cum trans. ad tyndarum et*  
*hispanicam, fasciis fulvis, ocellis ma-*  
*rioribus*.)
- var. ? *iranica*, Gr.-Gr., Hor. Ent. Ross., xxiv, p. Pers. bor. alp.  
291 (*non vidi*) . . . . . (Demavend).
- var. *hispania* (rect. *hispanica*), Butl. Cat., 86, And. mont. alp.  
t. ii. . . . .  
(*major, ocellis maximis, subt. unicolor*.)
- var. *ottomana*, H.-S., 376, 379-80, vi, p. 8 ; Græcia. mer.  
Stgr., Hor. Ross. Ent., 1870, p. 67 . . . . . mont., Bith.  
mont., Arm.  
mont.
- var. *sibirica*, Stgr., Stett. ent. Zeit., 1881, Tarbagatai  
p. 270 . . . . . mont, Dahu-  
(*trans ad. dromum, nom. vix conserv-*  
*andum*.) . . . . . ria mont.
26. GORGE, Esp., 119, 4, 5 (ante 1800 ?) ; Hübn., 50, Sum. alp. Pyr.,  
2-5 . . . . . Hisp. bor.  
alp.
- var. *triopes*, Speyer, Stett. ent. Zeit., 1865, Sum. alp. (*cum*  
p. 248 . . . . . *forma typ.*  
(*al. ant. ocellis 3 apicalibus*.) . . . . . *mixta*).
- var. et ab. *erynis*, Esp., 121, 3 (*absque ocellis*) . Sum. alp. (Mont  
Cenis).

27. GORGONE, Bdv. Ic., 29, 5-8, i, p. 150 ; H.-S., 75, 76, 469-70 . . . . . Pyr. cent. alp.  
(Gavarnie).  
(*sp. dist. secut genitalia*, ♀ *subt. venis albicantibus*.)
28. GOANTE, Esp., 116, 1 (ante 1800 ?) ; H.-S., 77-79 Alp., Carp.  
mont.
29. PRONOE, Esp., 54, 1 (1780) ; Hübn., 215-17 . Alp., Austr.  
Alp., Carp.,  
Bith. mont.,  
Pyr.  
var. *pitho*, Hübn., 574-77 . . . . . Alp., Helv.,  
(*inconstans, obscurior, fasciis et ocellis subnullis*.) Tyrol.
30. ÆTHIOPS, Esp., 25, 1 ♂ (1777), 63, 1, ♀ . Eur. centr.,  
*medea*, Hübn., 220-22 ; *blandina*, Fabr., Angl. sept.,  
Ent. Syst., p. 236 (1793) . . . . . Turc., Bith.,  
? var. *melancholica*, H.-S., 276-79, vi, p. 10 . Cauc. Arm.  
Ross. mer.,  
Altai, Ararat.  
var. ? *æthiopella*, Stgr., Iris, x, p. 324 (*non vidi*) Kentei mont.  
(Mongolia).
31. SEDAKOVI, Ev., Bull. Mosc., 1847, iii, 70, t. i, 5, 6 ; H.-S., 591-92 . . . . . Sib. or Japan.  
*niphonica*, Jans., Cist. Ent., ii, p. 153, t. v, 5 (1877).  
var. ? vel bona sp. *alcmena*, Gr.-Gr., Hor. Ent. Ross., xxv, p. 457 (1891) ; Leech, Butt. China, p. 99, t. ix, 10, ♂ . . . . . Tibet or.
32. VIDLERI, Elw. (sp. nov., *sedakovi proxima secut genitalia distinguenda*) . . . . . Columbia Brit.
33. NEORIDAS, Bdv., Ind., p. 23, Ic., 29, 1-4 . . . Gal. mer. mont.  
ab. ? *margarita*, Ob., Feuille Jeunes Nat., No. Pyr.  
306 (1. 4. 96) ; Et. Ent, xx, p. 37, t. ix, 155, ♂.  
(*natura non vidi, secut descr. haud distinguenda*.)
34. ZAPATERI, Ob., Ann. Soc. Ent. Esp., iv, p. 370, t. 17, 1, 2 (1875) . . . . . Cat. Aragon  
mont.

35. EIGEA, Linn., Syst. Nat., ed. x, 473; Hübn., Eur. centr. et  
225-8 . . . . . sept., It.  
*ajanensis*, Mén., En., ii, p. 104 (1855). mont., Balk.  
*eumonia*, Mén., Schrenk's Reise, p. 34, t. iii, 4 pen., Ural,  
Sib. occ.  
centr. et or.,  
Kamschatka,  
Norv. bor.  
ab. ? et var. *adyte*, Hübn., 759-60; cf. Schilde, Dovrefjeld,  
Stett. ent. Zeit., 1873, p. 179 . . . . . Fen. Alp. ?  
(var. *minor*, *alpestris*, *inconstans*, ? *trans*.  
*in part ad euryalem*.)  
var. *livonica*, Teich., Stett. ent. Zeit., 1866, Liv., Mt. Oesel.  
p. 133 . . . . . Fen.  
(*inconstans*, ♂ *al. post. subt. unicoloribus*.)
36. EURYALE, Esp., 118, 2, 3; Hübn., 789-90; cf. Alp., Pyr., Sil.  
Meyer-Dür, p. 177 . . . . . Hung., It.  
(*bona sp. in part. secut genitalia distin-* mont., Dahu-  
*guenda*.) ria.  
var. *euryaloides*, Tengstr., Cat., p. 11. . . . . Fen., Ross. bor.,  
*jeniseiensis*, Trybom, Ofver. Vet. Akad. Sib. bor. ad  
Forh., 1877, p. 46. 68° N.  
(var. *inconstans*, *ocellis subnullis*, ? *trans*  
*ad ligeam in part*.)  
var. *ocellaris*, Stgr., Cat., p. 11 . . . . . Tyrol, Styr. et  
(*inconstans*, ♂ *supra mac. (non fasciis)* Car. Alp.  
*rufis* ♀ *al. post. subt. grisescentibus*.)
37. META, Stgr., Stett. ent. Zeit, 1886, p. 237 . . . . . Prov. Nama-  
*gertha*, Stgr., l. c. (var. *inconstans fasc. majus* gan mont.  
*distinctis*.)  
*mopsos*, Stgr., l. c., p. 239 (var. ? *major minus* Prov. Samar-  
*ocellata et fasciata*) . . . . . kand, Kuldja.  
*alexandra*, Stgr., l. c., 1887, p. 55 . . . . . A l e x a n d e r  
mts., Turkes-  
tan or.  
*issyka*, Stgr., l. c. . . . . Issykut, Turk-  
estan.  
var. ? *melanops*, Christ., Hor., Ent. Ross., xxiii, Prov. Samar-  
p. 299 . . . . . kand.
38. LAPPONA, Esp., 108, 3 (1798 ?) . . . . . Alp., Carp.,  
Scand., Balk.  
mont., Lap.  
Altai ?

- var. *sthenyo*, Grasl., Ann. Soc. Fr., 1850, t. 10,  
1-3 . . . . . Pyr. centr.  
(*inconstans*, fasc. supra et sub<sup>tus</sup> obsoletis  
vel indistinctis.)
39. OCNUS, Ev., Bull. Mosc., 1843, iii, 538, t. 8, 5, Sib. mer. alp.,  
a, b ; H.-S., 291-92 . . . . . Alatau mont.
40. SIBO, Alph., Lep. Kuldja (*ex* Hor. Ross. Ent., Kuldja prov.  
1881) p. 83, t. xv, 20, ♂, 21, ♀ ; ? var. vel alp. Thian-  
bona sp. . . . . shan, Transili  
*mongolica*, Ersch., Hor. Ent. Ross., xxii, p. 199, alp.  
t. ix, fig. 3, ♂ (1888) ; Gr.-Gr., Rom. Mém.,  
iv, p. 452, t. xiv, 3, ♂ (1890).
41. DABANENSIS, Ersch., Hor. Ent. Ross., viii, p. Dahuria mont.  
315 (1872) ; Rom. Mém., ii, t. xvi, 1, ♂  
? var. *tundra*, Stgr., Rom. Mém., iii, p. 148,  
t. viii, 1, ♀ (1888) . . . . . Sayansk mont.
42. TURANICA, Ersch., Hor. Ent. Ross., xii, p. 336 Alatau, Nama-  
(1876) ; Alph., *l. c.* (in sep.) t. xv, 22 gan, Thian-  
var. *leta*, Stgr., Stett. ent. Zeit., 1881, p. 275. shan mont.,  
? var. *tristis*, Gr.-Gr., Hor. Ent. Ross., xxvii, 3 — 10,000  
p. 383 (*non vidi*). ped. alt.
43. EMBLA, Thunb., Diss. Ent., 11 (Dec. 1791), p. Scand. centr. et  
38, t. f. 8, 8 . . . . . bor., Ross.  
sept., Sib.  
bor. ad 70° N.  
Amur sup. et  
inf.  
var. *succulenta*, Alph., Rom. Mém., ix, p. 325, Kamschatka,  
(1897) . . . . . Arga (Mon-  
*lama*, Stgr., MSS. ? golia).  
(var. *dilutior* ? *distincte ocellata* ? *nomen*  
*conservandum*.)  
*embla*, var. vel. transitus ad *disam* ? . . . Prov. Irkutsk.  
*embla-disa*, Mén., *cf.* Mén., Cat. Lep. Mus. ad fluv. Vil-  
Petr., p. 105 ; Mén., Lep. Sib. or., Schrenck's ni, Vitim et  
Reise, p. 358 ; Mén., Bull. Phys. Acad. Oudim.  
Petr., 1859, p. 218.
44. DISA, Thunb., *l. c.*, p. 37 ; Freyer, 416, 1, 2 . Lap. Norv. bor.  
*griela*, Hübn., 228-9. Karelia.

- var. *mancinus*, Doubl. Hew., Gen. Di. Lep., ii, Prov. Alberta,  
 p. 380, Atlas, t. 54 (1850-52) . . . . . Brit. Colum-  
 (al. ant. supra disc. rufescentibus al. post. bia.  
 subt. minus fasciatis.)
45. ROSSI, Curt., App. Ross. Voy., p. 67, t. A, 7 Boothia Felix,  
 (1835); Aurivillius, Ins. Vega Exp., iv, Am. Arct. 67°  
 p. 75, t. 1, 4 (1885) . . . . . — 68° N.,  
 var. vel. syn. ? *ero*, Brem., Lep. Ost. Sib., p. Hudson Bay,  
 20, t. 11, 1. St. Lawrence  
 Bay, N. E.  
 Asia, Apfel  
 Gebirge  
 (Amur sup.),  
 Sayansk mts.  
 D a h u r i a ,  
 Yenesei, 78°  
 N. (Trybom).
46. EDDA, Mén., Midd. Reise, p. 58, t. iii, 11 (1851); Sib. or. bor.  
 Graeser, Berl. ent. Zeitschr, 1888, p. 96 . (Prov. Ir-  
 kutsk, Yene-  
 sei flum. ad  
 65° N.)
47. CYCLOPIUS, Ev., Bull. Mosc., 1844, iii, 590, Ural mont.,  
 t. xiv, 3, a, b; H.-S., 607-8 . . . . . Sib. centr. et  
 or.
48. TRISTIS, Brem., Bull. Acad., 1861, t. iii . . . . Amur (Burcija).  
*wanga*, Brem., Lep. Ost. Sib., p. 20, t. ii, 1.  
 ? var. *saxicola*, Ob., Et. Ent., ii, p. 32, t. iv, 1 Mongolia  
 (1876) (*non vidi*) . . . . . (Ourato).
49. DISCOIDALIS, Kirby, Faun. Bor. Am., iv, p. 298, Am. bor. Hud-  
 t. iii, 2, 3; Graeser, Berl. ent. Zeitschr., son Bay,  
 1888, p. 96 . . . . . Canada occ.,  
*lena*, Christoph, Hor. Ent. Ross., xxiii, p. 299, Prov. Alber-  
 (fide Alphéraky, *non vidi*). ta, Amur.  
 sup., Sib. or.  
 et bor. ad  
 70° N.
50. EPISTYGNE, Hübn., Verz., p. 62 (1816); Hübn., Gall. mer. or.  
 855-58 . . . . . mont.

51. AFRA, Esp., 83, 4, 5 (1783) . . . . . Ross. mer., Altai  
mont., Tarba-  
gatai mont.,  
Cauc. mer.  
mont.  
var. *dalmata*, Godt., Enc. Méth., p. 530 . Dalmatia (*prope*  
(*major*?, *subtus majis unicolor, venis minus*  
*albicantibus.*) Zara), Aska-  
bad, Persia  
sept. (*fide*  
Christoph,  
*non vidi*).

## Subgenus distinctum ?

52. FASCIATA, Butl., Cat. Sat. B. Mus., p. 92, t. 2, 8 Amer. arct.  
(1868) . . . . . (Winter Cove,  
Cambridge  
Bay) voy.  
Collinson.  
53. MAGDALENA, Streck., Bull. Brook. Ent. Soc., iii, Colorado alp.,  
p. 35 (1880); Edw., Butt. N. Am. iii; pt. v; 12 — 14,000  
Ereb. i, 1-4 (1888) . . . . . ped. alt.  
54. ERYNNIS (recte *erima*), Stgr., Iris, vii, p. 247, Sayansk or.  
t. ix, 2, ♀ (1894) . . . . . mont. Sib.

## Genus ? novum distinctum ad PARALASAM vel CALLEREBIAM majus affine.

1. PARMENIO, Boeb., Nouv. Mém. Mosc., ii, p. 306,  
t. 19; H.-S., 421-22, 464-66 . . . . . Sib. cent. et or.  
2. MYOPS, Stgr., Stett. ent. Zeit., 1881, p. 296 . Alatau mont.,  
Persia sept.  
3. MARACANDICA, Ersch., Lep. Turk., p. 17, t. 1, 13 Pamir, Alai  
(1874) . . . . . mer.  
4. RADIANS, Stgr., Stett. ent. Zeit., 1886, p. 240 . Kuldja mont.,  
prov. Fer-  
ghana mont.  
5. KALMUKA, Alph., Lep. Kuldja (Hor. Ent. Ross., Thianshan  
1881), p. 81, t. 18, ♂, 19, ♀ . . . . . mont.  
6. HADES, Stgr., Berl. ent. Zeitschr., 1882, p. 172 . Alai, Pamir  
mont.

7. HERSE, Gr.-Gr., Hor. Ent. Ross., xxv, p. 457  
 (1891); Leech, Butt. China, p. 99, t. ix, Tibet or., Sinin  
 7, ♀, 8, ♂ . . . . . mont.

Genus PARALASA, Moore, Butt. Ind.

1. MANI, de Nicév., Journ. As. Soc. Beng., xlix, 2,  
 p. 247 (1880); Butt. Ind., I, p. 242, t. xv,  
 43, ♂ . . . . . Prov. Ladak.  
*jordana*, Stgr., Berl. ent. Zeitschr., 1882, Prov. Khokand  
 p. 171 . . . . . mont.  
 var. ? *roxane*, Gr.-Gr., Rom. Mém., iii, p. 401, Alai Pamir  
 (1888) . . . . . mont.  
 (*al. post. supra rufo-fasciatis, subtus  
 punctis albis subnullis*)
2. KALINDA, Moore, P.Z.S., 1865, p. 301, t. xxx, Him. occ. 9--  
 5, ♀; Marsh. & de Nicév., Butt. Ind., p. 241 13,000 ped.  
 alt.
3. SHALLADA, Lang, J. As. Soc. Beng., xlix, 2, Him. occ., 6--  
 p. 247 (1880); Marsh. & de Nicév., l. c., 8,000 ped.  
 t. xv, 42, ♂ . . . . . alt.

The group of small *Erebias*, which are mostly peculiar to the Alps of Europe, and some of which are rather local, have been separated generically under the name of *Orcina*, Westw.; but I can find no character which justifies their separation from *Erebia*, and even if there were, the name is preoccupied. Though several of the species occur abundantly together on the same ground, fly at the same time, and have similar habits, I have no reason to believe that hybrids occur; and though abnormal varieties of *E. epiphron*, *melampus*, *eriphyle*, *pharte*, *manto*, are often difficult to identify without a good series and an intimate knowledge of their variations, yet they can be separated without having recourse to the genitalia, when one knows them well enough. I have nothing to add to what I wrote of the varieties of *E. epiphron* and *E. melampus*; but *E. eriphyle*, which I formerly thought a doubtful species, seems, now that I know it better from the fine series kindly given me by Dr. Chapman, to be distinct.

In the Central Alps it is rare or local, the variety described by Freyer, which occurs at Davos, and occa-

sionally in other parts of Switzerland, being less distinctly marked than those from Tyrol and Carinthia, where in certain places it is very abundant. On the San and Kur Alps near Stetzing it seems to be very numerous, and flies in company with *E. pharte* (which it often very closely resembles), *cassiope*, and *melampus*. I have taken it myself only in the Lechthal, near the Arlberg pass, and failed to recognise it at the time. Dr. Chapman found it at San Anton, on the east side of that pass, the specimens from these places being intermediate between those from Switzerland and Carinthia.

It may be recognised on the upperside by the shape, and especially by the position, of the fulvous markings of the hindwing; these are normally four in number, of which in Swiss specimens the two hindermost are usually faint or absent, and in Carinthian examples usually distinct. These marks are not placed in a regular line parallel to the outer margin, as in *E. pharte*, *melampus*, and *cassiope* but in pairs, of which the upper two are close together, and the second, always the most conspicuous, and the last to disappear, is more or less elongated towards the base of the wing. The band of the forewing has usually two (in the females and in both sexes from Carinthia sometimes three or four) black spots, which are very rare in *E. pharte* (I have only two females which show any trace of them). On the underside the male has the base of the forewing more suffused with rufous and the band of the forewing not so well defined. On the hindwing in the females and Carinthian males there is sometimes a fifth spot nearer the costa, in which case the elongated spot is the middle one. The colour of the hindwing in the female is more chocolate, and less grey than in *E. pharte*. From *E. melampus* it may be known by the absence of black eyes in the fulvous spots of the underside of the hindwing. There are occasionally small male specimens of *E. manto* var. *pyrrhula*, which are hard to distinguish from Swiss specimens of *E. eriphyle*, and these as well as abnormal *melampus* often stand for it in collections; but, by using glass-bottomed drawers, which enable the whole series of undersides to be seen at once, the difference, however slight, can be appreciated, and though the females of *eriphyle*, *pharte*, and *melampus* are close, that sex of *E. manto* in all its varieties is easily distinguished by the pale base of the hindwing below.

*Erebia kefersteini*.

This is an eastern form, of which I knew little nine years ago, but I have now received specimens from the Chamar Daban Mountains near Lake Baikal, where it seems abundant. It is nearest to *E. melampus*, from which it can usually (perhaps not always) be distinguished by the inner area of the forewing being more or less tinged with red-brown and the band on the inside being less well defined. The difference in the genitalia is however enough to decide on in doubtful cases.

*Erebia flavofasciata*, Heyne.

It seems almost incredible that a new species of *Erebia* so distinct in appearance as this should be discovered in a part of the Alps which must have been often visited by collectors, but such is the case. It was found by Lieut.-Col. von Nolte on July 8, 1893, on the Campolungo pass between Fusio on the upper part of Val Maggia, and Faido on the Val Levantina in the Canton Ticino at about 7,500 feet elevation.

It flies on the east side of the pass, on grassy slopes among rocks, in company with *E. cassiope* and *gorge*, and apparently comes out about the end of June, as some of the males were much worn on July 8. It is distinguished from *E. melampus*, to which it apparently comes nearest, and from all other species by a well-defined yellowish band on the underside of the hindwing, in which five dark spots appear. On the forewing below there are four similar spots, placed in a narrower darker band, which towards the hindwing becomes merged in the ground colour of the wing. On the upper side the bands are nearly or quite obsolete, well marked only towards the apex of the forewing. The spots above are in some specimens more or less obsolete, especially on the hindwing.

The female, which I have not seen, is said to resemble the male.

Dr. Chapman informs me that there are two specimens of this species in Mr. Nicholson's collection, which were taken by his father somewhere in the Upper Engadine, and there is little doubt that the species is not so restricted in its habitat as it now seems to be.

The genitalia are distinct from those of *E. melampus* or any other species.

*Erebia christi*.

Rätzer, MT. Schweitz. ent. Ges. viii, p. 220, 1890, ♂.

Schulz, Stett. ent. Zeit. liii, p. 359, 1892, ♀.

The position of this newly discovered species is at present a little doubtful. It looks so near to some specimens of *E. mnestra* that I should have been doubtful as to its specific distinction if it were not for the genitalia, which show it to be different from all European species; while its occurrence in quantity proves that it cannot be a hybrid between *E. cassiope* and *mnestra*, of which it seems to combine the characters.

Schulz, who first described the female, says that *E. mnestra* occurs in great numbers in the same place where he found *E. christi*, and after discussing carefully the opinions of Dr. Christ, of Rätzer, and of Dr. Staudinger, which he quotes, he comes to the conclusion that the species is more nearly allied to *cassiope* than to *mnestra*, though it averages from a half to a quarter larger in size than *E. cassiope*.

The only locality in which *christi* has been taken, so far as I know, is the Laguinthal near the village of Simpeln or Simplon on the pass of that name, where it flies during the first half of July on steep slopes covered with a rich Alpine vegetation between steep cliffs and stone shoots.

*Erebia maurisius*, *E. kindermanni*, *E. haberhaueri* and probably *E. pawlowskyi* and *E. stubbendorfi* form a group which comes nearest to *E. pharte*, and has a wide range all through the mountains of Central Siberia. Whether they can be distinguished as separate species seems very doubtful, and the synonymy is difficult, because it is not easy to say from Esper's figure which of the forms he knew. That however which has been identified with this figure by continental entomologists is found in the Altai and mountains south and west of Irkutsk, and has a well-marked chocolate patch in the cell of the forewing above and a well-marked series of elongate brown spots on the hindwing below, which often shows a much paler central streak.

*E. kindermanni*, Stgr., may or may not be the same as this. It was described from a single pair from the Altai in Lederer's collection at a time when Dr. Staudinger says he did not know *E. maurisius*. No one has since discriminated between the two, so far as I know.

*E. stubbendorfi*, Mén., or what has been identified with this by Staudinger, is like *maurisius* but with little or no chocolate in the cell; the band of yellowish patches on the forewing is therefore more defined on the underside and on the hindwing variable or even absent.

*E. haberhaueri* was taken in the Tarbagatai mountains which are connected with the Altai range, and differs in having the chocolate cell less defined and in the smaller and rounder spots of the hindwing below, which in one of my specimens are almost obsolete.

*E. pawlowskyi* from the mountains near Urga and of Irkutsk, has no chocolate in the cell above, and the band of spots on both wings much reduced. On the underside however the series on both wings is more conspicuous and much paler in colour (in the ♀ almost white), but there is considerable variation in the size, number and colour.

Dr. Chapman can find no characters in the clasps of any of these by which they can be distinguished *inter se*.

In the Yellowstone Park of North America and also on the west coast of Hudson's Bay has been found an *Erebia*, which Strecker described as *sofia* and considered almost the same as *haberhaueri*, and which was afterwards named *ethela* by Edwards. I have three males and two females from the Yellowstone which have most resemblance to the male of *E. haberhaueri* and the female of *E. pawlowskyi*. All five however have a more or less defined pale patch in the cell of the hindwing below, of which only a faint trace can be seen in two or three of my 20 Asiatic specimens, and by this patch I am at present able to distinguish any American from any Asiatic specimen I have seen.

The nomenclature might therefore best stand as follows :

<i>E. maurisius</i> , Esp. . . . .	Mountains of Central
= <i>kindermanni</i> , Stgr.	Siberia from Altai to
var. ? <i>haberhaueri</i> , Stgr.	Dahuria.
var. ? <i>stubbendorfi</i> , Mén.	
var. <i>pawlowskyi</i> , Mén.	
var. vel bona sp. <i>sofia</i> , Streck. . . .	Fort Churchill, Hudson's
= <i>ethela</i> , W. H. Edw.	Bay ; U.S.A., Yellow-
	stone Park, Montana,
	about 8,000 ft.

### *Erebia theano*.

This species, though apparently belonging to the same group as *maurisius*, is very well distinguished by the pale

yellowish markings at the base of the hindwing below, which somewhat resemble those of the ♀ of *E. manto*. It is one of the most distinct of all the Asiatic *Erebias*, and has, so far, as I know, only been found in the Altai mountains, though it is also recorded (on what authority I do not know) from the Amur region.

*Erebia manto*.

This is a common but very variable species, always distinguishable by the markings of the hindwing below, which in the female are very distinct and unlike those of other species.

In certain localities it has a small high Alpine form (*pyrrhula*, Frey.), which seems to be constant on the Albula pass in the Engadine, and at San Anton on the Arlberg pass. Similar small specimens occur occasionally elsewhere.

In the Pyrenees it occurs in a very distinct form usually referred to *cæcilia*, Hübn. This is quite black without any markings in the male sex, and with only an indistinct band in the forewing below, and sometimes a trace of the outer band in the hindwing.

Something like this occurs rarely as an aberration in the Alps, but I have never seen one quite like the Pyrenean insect, and if the clasp were not identical, I should be disposed to separate this. As however I am not certain whether true *manto* occurs in the Pyrenees or not, I think it best to wait.

*Erebia ceto*.

Another common species, varying very much in different localities. On the south side of the Alps it usually has a well marked band of seven chocolate streaks of which three, four or five contain black ocelli sometimes, especially in the female, pupilled with white. On the Col de Lauterets in the Western Alps it is much smaller, and the markings are much less distinct, though of the same peculiar type.

*Erebia medusa*.

The opinion expressed by Strecker, which I quoted, as to the probability of *epipsodea* being the American form of

this insect is not confirmed by an examination of the genitalia, which show *epipsodea* to be quite distinct.

The varieties *uralensis* and *polaris*, which have also been separated, prove to be without doubt only well-marked forms of *medusa*. Though *uralensis* on its underside resembles *epipsodea* much more than *medusa*, the form of its clasp is that of *medusa*. Several specimens from the province of Irkutsk in Siberia sent to me by M. Alphéraky are intermediate between Scandinavian *polaris* and Alpine *medusa*, the males being like *medusa* and the females nearer to *polaris*.

*Erebia œme*, var. *spodia*, Stgr.

This form, which on the upper side resembles *medusa* more than typical *œme*, and of which the larva is said by Ruhl to be like that of *medusa*, proves to be rightly placed as a variety of *œme*, which it represents in the Alps of Salzburg and Styria. Struve records this form from the Port de la Picade in the Pyrenees, but all those I have taken and seen in the Pyrenees at Luchon and Cauterets are typical *œme* with the ocelli not more developed than in the Alps.

*Erebia hippomedusa*.

This is a small form which occurs in the S.E. Alps and is very difficult to distinguish from *spodia*. Whether, as Staudinger thinks, it is a form of *œme* rather than of *medusa* I have not sufficient evidence or material to decide, but at Trafoi it seems to occur as a variety and not as an aberration, which many of the so-called *hippomedusa* in collections seem to be.

*Erebia epipsodea*.

Since I wrote last I have collected *epipsodea* myself in many places. It seems to be a most wide-ranging species and as much at home in the open prairies at 2-3,000 ft. elevation as on the high alps of Colorado and the Northern Rockies. It is a very variable species, and I now think that what I called var. *brucei* must be looked on rather as an aberration occurring rarely in various localities than as a local alpine variety, as I formerly supposed. Anyhow,

I found no more of it in the region where Bruce discovered it, and besides his original two specimens, only one other has, I think, been since recorded from the province of Assiniboia, N.W.T.

Dr. Chapman would take this species out of the position in which I place it next to *medusa*, on account of the different form of the clasp, but it seems to me so near *uralensis* and *polaris* that I prefer to keep it here.

### *Erebia melas*.

The difficulty which I formerly found in understanding the geographical distribution of this species is now removed by the fact, proved by the form of the clasps, that the true *melas* does not occur in central Europe or the Pyrenees.

The only certain habitats which I know of at present for this species are the South-Western Carpathians, where it occurs abundantly in the neighbourhood of Mehadia at about 5,000 ft. elevation, and the mountains of Veluchi, in Northern Greece, where it has been taken by Dr. Kruper.

I have a single specimen with a ticket "Stens? Dalm." from the Vienna Museum, which seems intermediate between *E. nerine* and *melas*; it is probable that a form of one or other of these species exists on the mountains of Croatia and Dalmatia. The form which I took at Campiglio in the Tyrol is now proved to belong to *glacialis*, and not to *melas*, though at first sight it much more closely resembles the latter.

The colour of this species, when quite fresh, is black, and in one male taken at Mehadia by Miss Fountaine there is a distinct chocolate patch on the forewing below, sharply defined on the inside and including the three ocelli. A trace of this colour shows on the upper side, and in the female it is conspicuous on both surfaces. The ocelli of the hindwing, normally three in number but occasionally four, are sometimes wanting on the upper as well as the undersides.

### *Erebia lefebvrei*.

This is without question a distinct species, confined to the Pyrenees and Asturias mountains. It has three

forms which have been defined by Oberthür, Et. Ent. viii, p. 22, as *pyrenea*, inhabiting the Eastern Pyrenees, *lefebvrei*, the central Pyrenees, and *astur*, the extreme western extension of these mountains, called the Picos de Europa. I am unable to say whether these three races can be certainly defined, or whether they have intermediate variations and intergrades, but the latter case seems the more probable. All of them frequent steep stony slopes at from 6000–9000 feet elevation. The central form has the ocelli the most developed, and in the western form they are nearly obsolete.

*Erebia hewitsoni*.

This species, which I had previously treated as a form of *melas*, seems by the form of the clasp, as well as by the constantly present chocolate band on both wings and the more numerous and conspicuous ocelli, to be good and distinct; it has more resemblance to *evias* than to *melas*. It inhabits the Transcaucasian region, where it is found at Borjoin, Abbas Tuman and in Suanetia in May and June. Dr. Chapman thinks it nearer to *evias* than to *melas*, and I am quite ready to agree with him in this.

*Erebia stygne*.

A well-marked form of this, which seems to be prevalent in the Valais of Switzerland, which I also found constant on the Splügen pass, and which occurs also in other parts of Switzerland, but never, so far as I know, in the Black Forest or Pyrenees, is better worthy of distinction than many which have received varietal names. It has the rufous band on both wings above nearly or entirely wanting, though usually there is a trace of it round the ocelli, which are very small and inconspicuous. On the underside the band is also much reduced, the ocelli are small, and in the female the hindwing below is much more uniform in colour.

This, though perhaps a local, is not an alpine variety, as I have from Zermatt, from Briançon and from Lanslebourg, on the Mont Cenis, the normal form. I propose to distinguish this as var. *valesiaca*.

*Erebia nerine*.

This is a species confined to the eastern alps, occurring in the Lower Engadine and valleys south of the Stelvio pass, in great abundance at Riva as low as 1,500 feet, where I took it fresh on very hot rocky slopes as late as the end of July, at Campiglio, up to 5,000 feet, and on the Mendel Pass, in the Italian Tyrol, where Mr. Tutt found it still fresh on August 11th. A variety, which is called *reichlini*, H.-S., occurs in the Salzkammergut and differs from the typical Tyrolese form in having the chocolate bands of the forewing above faint and ill-defined and the ocelli smaller. On the underside the ocelli of the hindwing are faint or absent.

Another variety, *morula*, Speyer (*cf.* Stgr., *Iris*, viii, p. 286), which Staudinger calls a small alpine variety, is distinguished in typical ♂ specimens by the almost uniform dark-brown colour of the hindwing below, without the whitish dusting which in many of the typical forms almost forms an irregular band. I do not know where, if anywhere, this form occurs as a variety. "Schluterbach" and "Preth" are two localities, and the Leisser Alp in South Tyrol is cited by Ruhl. Mr. Tutt, at a meeting of the Entomological Society, disputed the possibility of separating these named forms, and exhibited a long series showing considerable variation from the Dolomite Alps. But the few specimens I possess of *reichlini* and *morula* do show the differences mentioned by Staudinger, and none of those I saw of Mr. Tutt's or of my own taking, agreed with them; so that I am inclined to let these varietal names stand.

With regard, however, to the var. *stelviana*, Curo, with which specimens in Frey's collection, named var. *italica*, are identical, and of which I have specimens from the Stelvio pass, Bormio and the Val Muranza, I can see no difference from the typical form worth noting.

*Nerine* may easily be confused with some forms of *E. pronoe*, from which however the underside always furnishes a distinctive character. It may also in some forms be confused with large brightly marked specimens of *E. stygne*, which has the inner side of the band on the forewing below always sharply defined (also the case in *E. cvias*); whilst in *nerine* the chocolate colour is diffused, spreading to the base of the forewing below.

*Erebia scipio*.

This seems to me to be really the nearest ally of *nerine* and represents it in the Western Alps. It is probably only a form of it separated by a widish interval of country, in which so far as I know neither form occurs; and the females are much more distinct below than the males. An interesting account of its habits is given by Mr. Tutt in the "Proceedings of the South London Entomological Society" for 1897, p. 63.

*Erebia pronoe*.

The species varies to some extent, but the so-called var. *pitho*, in which the bands and ocelli are less distinct or absent is inconstant. Frey says that typical *pronoe*, the usual form in the Austrian Alps and Tyrol, does not occur in Switzerland, but I have taken an example at the Rhone glacier in the Upper Valais which cannot be distinguished from *pronoe*. I have seen no good series of the so-called var. *pyrenaica*, but do not think it is at all constant; and the so-called *melancholica* from Armenia is almost certainly a form of *athiops*.

*Erebia gorgone*.

This which I previously placed as a form of *gorge* proves to be a species separable, not only by its genitalia, but also by the white veins of the hindwings below, from *gorge* which also occurs in the Pyrenees.

*Erebia melancholica*.

This which I formerly placed with doubt under *pronoe* must now I think be dropped out of the list of species altogether. Specimens from Lederer's collection lent me by Dr. Staudinger, and probably of the same origin as the type, are inseparable so far as I can judge from *athiops*, and no fresh ones have been obtained.

*Erebia sedakovi*, var. *alemena*.

This was described by Grum-Grshimailo from the province of Amdo in Northern Tibet and has also been found

in the Sinin Alps, which I cannot find in the map but which I believe are farther east towards Koko Nor, and southwards to Ta-t sien-lo, where Leech says it differs from the typical specimens in the paler fascia of the forewings, and grayer colour of the hindwings below. Alphéraky, speaking of specimens from Ta-t sien-lo, says that they are intermediate between the Siberian type of *sedakovi* and those from the Sinin Alps. I have specimens in my collection from the Sinin Alps sent by Alphéraky which are quite similar to *æthiops*, and I very much doubt whether either *sedakovi* or *alemena* could be separated from *æthiops* if a large series were brought together.

This seems to be the only true *Erebia* found in Tibet or China.

*Erebia vidleri*, sp. n.

I describe under this name a species which is only known at present from specimens taken by Capt. Vidler on the mountains above Seton Lake, near Lilloet on the Fraser river, British Columbia, in July 1885. For a pair of these I am greatly indebted to Mr. Fletcher of Ottawa; though the male is in a very worn condition they afford sufficient material for description, which I here give.

In size, colour and markings like *E. sedakovi*, of which at first I thought the insect might be an American variety. The difference in the genitalia, however, is too great to admit this supposition and I believe the species may best be placed near *ligea*.

The band on the forewing above is yellow brown in colour and extends right across the wing enclosing three small dark brown ocelli; of which the two upper ones are white-pupilled. The band on the hindwing is shorter than in *sedakovi*, only extending about half way across the wing and containing two brown spots of which the upper is very small.

On the underside the band on the forewing does not reach the costa and the band of the hindwing is very like that of *æthiops* or *sedakovi*.

*Erebia margarita*.

Judging from M. Oberthür's figure and description this is a very doubtful species. I believe it to be only an aberration of *neoridas* without ocelli on the hindwing. I have a

specimen of this species in which the form of band of the forewing, which Oberthür considers as a distinctive character, is almost exactly as in *margarita*; and it seems that only one specimen as yet has been taken in a locality where *neoridas* is common. M. Oberthür says that the flight is different, but as he has not hitherto been able to procure more specimens of it, it must be extremely rare at Vernet.

M. Oberthür says that he expects the validity of this species to be contested, and that it is a practice with many entomologists to refuse to recognise species which they do not possess. I hope he will not put me among them because, though, as I have said, it is never easy to form a correct opinion in such cases without a good series of specimens, yet his excellent figure of *margarita* does enable me to see that taken by itself the insect is not nearly so distinct from *neoridas* as are many other forms of *Erebia* which are universally admitted to be only varieties.

*Erebia ligca* and *E. euryale*.

Though I have made a careful study of a very large series of these species, from most of the localities where they occur, in the British Museum and my own collection, which contains 125 selected examples, I have had the very greatest difficulty in coming to any conclusion about them, and though I have rewritten this article three times, I am still by no means sure that my conclusions are correct.

In my former paper on *Erebia* I treated them as variable forms of one species, and though I now think that *ligca* and *euryale* can in most parts of Europe be separated by the somewhat slight but fairly constant difference of their genitalia taken in conjunction with other characters, yet in North Europe, probably also in Siberia, forms occur which might be called by either name and even from the Tyrol I have specimens of whose specific identity I cannot be sure.

The facts, so far as I have been able to work them out, are as follows. In Central Europe, in woody places at low elevations, and in the Alps up to about 3,000 feet, the typical *ligca* alone occurs, a large species with broad rufous band across both wings above, in both sexes containing on the forewing usually four (sometimes only three) and on the hindwing usually three (but sometimes four) black

ocelli; often in the male and almost always in the female pupilled with white.

On the male below the fulvous band is usually well marked on the forewing but faint and indefinite on the hindwing, and is bounded on the inside by a white streak, broadest and most distinct on the costa and often extended in a broken irregular line about half across the wing.

This streak will always distinguish the males of typical *ligea* from typical *eurysale*, in which it is either absent or faint and irregular. In *ligea* ♀ there is usually a broad yellowish band on the hindwing below showing distinct ocelli; and sometimes the base of the wing is also fulvous. Often the band is greyish and then the base is also greyish, sometimes the band is absent and then the sexes are almost similar.

In the Carpathians, Balkan peninsula and Ural Mountains both species are said to occur, but I have seen only *ligea*.

From the Caucasus neither is recorded. In the Altai typical *ligea* is found, but some specimens from Dahuria which equal or exceed *ligea* in size seem to be a variety of *eurysale*.

*Ajanensis* of Ménétries, which is common in Eastern Siberia in the Vitim district, the Venta mountains and along the Amur to its mouth, is inseparable from *ligea* though the fulvous bands are somewhat lighter in colour and the white streak below is more extended. I have seen as yet no example from North-West America which can be referred to *ligea*, but expect it to occur in Northern British Columbia or Alaska.

*Eurysale* is even more variable than *ligea* and is typically a smaller and more alpine butterfly. In the Pyrenees and Alps it is common and occurs from about 3,000 to 6,000 or 7,000 feet. It also occurs in the Isergebirge of Silesia, where a variety with distinct bands and ocelli on the hindwing seems to be pretty constant.

In the Alps the bands and ocelli above are sometimes faint or nearly absent and in the male the hindwing below has often no rufous band and no trace of white, and the ocelli are often faint or absent. In the Dolomite region, especially at Heiligenblut, occurs a variety, *ocellaris*, Stgr.; this is fairly constant, and is well marked above by the absence of the rufous band, which is replaced by small

rufous patches with black dots in the centre. In the female only white pupils sometimes occur. On the underside the rufous band is present on the forewing and the hindwing in the ♂ has a greyish band, usually faint in the male and conspicuous in the female.

In the Irkut district of Siberia a somewhat similar form occurs, but I have seen none from Western Siberia.

I know of no character by which the female of *ligea* can be certainly distinguished from *euryalae*, and where the two species fly together, as I have found them do in the Vorarlberg and at Campiglio in Tyrol, I cannot tell the females apart.

In Central Italy Herr Calberla says the two species are distinct in their habitat, *ligea* inhabiting the region of deciduous trees, and *euryalae* occurring on treeless slopes at a higher elevation. In the Alps typical *euryalae* always extends to a much higher elevation than *ligea*, ascending to 6,000 feet or more, and is usually quite easy to distinguish.

The form described as *adyte*, Hübn., which from the genitalia I take to belong to *ligea*, occurs in the Alps so far as I know only as an occasional aberration; what are called *adyte* in collections are often only small *ligea*, or *euryalae* with the markings of *ligea*.

But in the Dovrefjeld of Norway and in Saltdalen (probably elsewhere) a form of *ligea*, judging from its genitalia, which is called *adyte*, but which sometimes resembles *euryalae* more than *ligea* and varies considerably, is found; and I have seen no specimens from Scandinavia whose genitalia are those of *euryalae*. In Sweden more or less typical *ligea* occurs and on the east of the Baltic various forms of it such as *livonica*, Teich., which has the rufous band above much fainter and the hindwings below nearly unicolorous. This however seems to be inconstant. In Finland various forms occur, some of which seem nearer to *ligea*, and others, as *curyaloides*, Tengstr., in which the ocelli have nearly or quite disappeared, are more like *euryalae* (Schilde says that *ligea*, *adyte*, and *euryalae* are all found there and treats them as one species). What was described as *jeniseiensis* by Trybom is inseparable and most resembles Finland specimens. In France Sand reports *ligea* from Auvergne; but I have seen no French specimens.

*Erebia dabanensis* and *E. tundra*.

When I last wrote on *Erebia* I had not seen either of these species, but owing to the kindness of M. Alphéraky, who sent me a series of the former from the Grand Duke's collection for examination, and to that of Dr. Staudinger, who lent me the ♂ type of *tundra*, I am better able to speak of them. They are both from the same region; *dabanensis* having been taken in the mountains of the Irkut river, by Lederer, and *tundra*, in the Chamar Daban range south of Lake Baikal. They are easily distinguished from any other Siberian species by the distinct band on the underside, and have a band normally composed of four chocolate or fulvous spots pupilled with black nearly in a straight line across the forewing above, and three similar spots on the hindwing. M. Alphéraky believes that the two species are identical, and I think he is right, as I can find no difference but a slight one in the form of the clasp; but the only known male of *tundra* is in too bad condition to be of much value. Dr. Staudinger sent me a ♂ of what he calls *dabanensis*, from "Ost Sajan" (see under *E. crinna*), which may not be the same as those taken by Lederer, and among those sent by M. Alphéraky was a female which may belong to another species. But whether these differences are simply due, as I believe, to variation or not, cannot be decided until more specimens are taken. I believe that the correct position of these species is not near *melampus*, as Staudinger thought, but near *meta* and *lappona*.

*Erebia embla* and *E. disa*.

Though these two have been regarded by most recent authors as good and distinct species, and though I am able to distinguish them by what seem to be fairly constant characters, yet I am now doubtful whether the opinion first expressed by Ménétrics in his "Catalogue of the Lepidoptera of the Petersburg Museum," p. 105, afterwards questioned by him in his "Lepidoptera of Eastern Siberia," p. 35, and finally confirmed in a paper published in the "Bulletin" of the Academy of St Petersburg, 1859, p. 218, to the effect that they could not be separated was not correct. The differences which have been pointed out by Staudinger (Stett. ent. Zeit. 1861, p. 353), who took *disa* abundantly in Arctic Norway in June, and was

of opinion that it was perfectly distinct from *embla*, principally consist in the presence on the hindwing below of *disa* of a line of crescent-shaped marks on the outer greyish coloured half of the wing. *Embla* in Europe never seems to have these, but in some parts of Eastern Siberia, in the province of Irkutsk, though not in Kamschatka, it has these markings more or less developed, and forms a kind of transition to *disa*.

Specimens from this region undoubtedly led Ménétries to form a contrary opinion to that of so good a judge as Staudinger. I have often observed in similar cases that the difference of opinion of really competent judges on such questions can nearly always be explained by the different materials before them, and can usually be reconciled when each has been able to see the same specimens.

The geographical distribution of *embla* and *disa* is inexplicable if we assume them to be two species, and is remarkable enough if we look on them as one.

*Disa* has been found, so far as I know, only in Arctic Norway and the Kola peninsula, where it flies at sea level, and in the interior of Lapland, from Junkersdal in the upper part of Saltdalen, just within the arctic circle on the Swedish frontier, where Schøyen found it in July, to Karasjok and Muonioniska, where the late Mr. Meinertzhagen took it recently on the 12th of June in quite fresh condition. Schøyen also reports it from Wojmsjoen and Wallengren from near Sorsele, both in Umea Lappmark, which is the most southerly record I have.

The only other locality which I know of for certain is near Laggan, in the Rocky mountains of British Columbia, where it is rare and local according to Mr. Bean. When I was there in July, 1893, its season was nearly over, but I saw two or three specimens, and caught one flying in open marshy pine woods, surrounded by marshy meadows, on the banks of the Bow river, two miles below Laggan. Its flight was quick, as described by Staudinger, who also says that at Bossekop it was restricted to grassy marshes. It settles on grasses, on which no doubt its larva lives. The American specimens agree with the type of what Hewitson described as *mancinus*, and differ from European ones in having the chocolate band of the forewing somewhat diffused through the cell, which therefore shows a chocolate tinge on both surfaces. A trace of this in the

form of an obscure spot sometimes occurs in Norwegian *disa*, and therefore I am not able on the strength of three or four specimens of the male sex only to admit *mancinus* as a marked variety.

*Disa*, var. *mancinus*, is also recorded by Edwards and Strecker from Alaska, but I have been unable to obtain any specimens from there for comparison. The typical *disa* markings on the underside of the hindwing are not so distinct on the American as in the European specimens, and the form of the genitalia is identical.

Now, when we turn to *embla*, we find it local in Southern Norway, where Schøyen takes it in Odalen near Christiania in June; and Siebke says it was taken by Wocke at Sigstad in the parish of Loiten in Hedemark on May 30.

Wallengren states that in Sweden its most southerly habitat is in Dalarne, where Quensel found it at Serna, that it occurs at Lycksele in Umea Lappmark, at Jockinock and Storsand, and at Öfre Tornea in Tornea Lappmark, and as far north as Karesuendo. I have specimens taken by Lampa near Quickjock which in marking are very distinct from *disa* and as the ranges of *disa* and *embla* here overlap, it is possible that the two species may here be separated; it would be very interesting to have further particulars as to their occurrence together or separately.

In Finland Schilde found *embla* common on bushy moor meadows from the end of June to the middle of July, and says it is very variable, sometimes losing all the ocelli except those in cell 4 and 5 of the forewing. I have specimens from St. Petersburg and from Olonek, and then I know of no record of its occurrence until the province of Irkutsk is reached, where, as I have already said, the hindwing below shows a transition to *disa*. M. Alphéraky tells me that the collection of the Grand Duke Nicholas contains no *disa* from Siberia; and though Ruhl gives Irkutsk as a locality, he is probably only quoting Ménétries.

In the mountains near Urga on the Mongolian frontier a variety occurs which Staudinger calls *lama*, but this is not, so far as I can judge from the pair he sent me, to be distinguished from Norwegian specimens.

Alphéraky also describes in Romanoff's "Mémoires," ix, p. 325, from Kamschatka a variety of *embla* which he calls *succulenta* and he has been good enough to send me four males and two females; excepting that the ocelli are more

developed as compared with those in examples from Vitim and Vilinsk, though not more so than in some Norwegian specimens, I do not see anything in them to justify a varietal name. If they are separated, however, the name must include specimens from Nikolaivsk.

*Erebia rossi*, *E. ero*, and *E. discoidalis*.

When I previously wrote on *E. rossi*, which I then knew only from Curtis's figure and description, I treated it as possibly a form of *disa*. Since then, through Prof. Aurivillius's kindness, I have had the opportunity of examining the single very bad specimen which was taken at St. Lawrence Bay in North-East Asia by the 'Vega' expedition.

I find that the genitalia of this specimen agree precisely with those of what Strecker had sent me from Hudson Bay as *fasciata*, and of what M. Alphéraky sends me from Irkut in Siberia as *ero* of Bremer; and on referring to M. Oberthür, whose collection contains three of the type specimens of *rossi* given by Curtis to Guenée, he admits that they are very near *ero*. If this be so, we find that the species is much more widely distributed in arctic America and Asia than was supposed.

*E. ero* of Bremer, which was taken by Radde in the Apfelgebirge, which seems to be a local name for a part of the mountains marked in maps as the Yablonnoi range, about five days' journey east from Kiatcha, has never been refound in that locality by any recent collector, so far as I know. Staudinger speaks of it as "Diese mir unbekannte Art." I cannot be certain from the figure and description that it is the same as the form sent me from Irkut by Alphéraky as *ero*. If, as I think, this is probably the case, then the name of *ero* must give place to that of *rossi*, which has many years' priority.

The species may be distinguished from *disa* by the chocolate suffusion of the whole disk of the forewing below, by the range of small white spots on the margin of the hindwing below, and the absence of the dark lunules in the same place.

From *discoidalis* it is easily distinguished by the presence of ocelli on the forewing, variable in number, and resembling in size, colour and position those of *E. disa*.

In the Hudson Bay specimens these ocelli are four or five in number, in Bremer's plate four, and in the Siberian specimens I have seen two or three.

There is a more or less distinct dark band followed by an outer paler one on the hindwing below, which is more visible in the American than in the Siberian specimens, and is hardly shown in Bremer's figure; but this is nothing like so distinct or well marked as in the true *fasciata*, which has a most distinct broad band below not only on the hindwing but right across the forewing and reaching the costa.

*Erebia cyclopius*.

A very distinct species in my opinion, though Dr. Chapman considers it a near ally of *embla-disa*. It extends from the Ural Mountains and eastern Altai to Amurland and the island of Askold, and appears to vary but little. The supposed variety of it described by Trybom from the Yenesei river as "var. *intermedia*," turns out from an examination of a specimen lent by Prof. Aurivillius to be *E. cdda*, a very different species.

*Erebia fasciata*.

This, so far as I know, has never been taken except at Winter Cove in Cambridge Bay, Victoria Land, about 69° N., 107° W., by Capt. Collinson's expedition, and by Sir John Richardson's expedition on the Arctic coast in 67-68° N.

These specimens are all in the British Museum except one pair which I received in exchange from this source.

*Erebia magdalena*.

This species, which I knew before only from specimens taken by Mr. Bruce, is at present only recorded from the mountains of Central Colorado. I was fortunate enough, when visiting this country in July, 1893, to see and take it myself. It frequents just such steep stony slopes as *E. glacialis* prefers in the Alps, and it seemed fairly common at from about 11,800 to 12,800 feet. During the first week in July I found it easier to catch and not so

strictly confined to stones and boulders as *glacialis*, but the great elevation and very uncertain weather of these high mountains make it a difficult species to procure in good condition.

I am inclined to think that a subgenus might be formed for *E. magdalena*, *E. erinna*, and perhaps *E. fasciata*; but I know so little of all of them at present that it may be better to wait before separating them from *Erebia*.

*Erebia erinna*, Stgr. Iris. vii, p. 247, t. ix, fig. 2, ♂ (1894).

Dr. Staudinger described this from a single pair from "Ost Sajan," probably a part of the mountains on the upper Yenesei river south of Minusinsk, which are marked in maps as the Sayansk mountains. M. Alphéraky very kindly sent me a damaged male, one of two which the Grand Duke Nicholas Mikhailovitch received from the Irkut river, which appears to rise in the very high mountains (over 11,000 feet) on the Chinese frontier, east of the Sayansk range; it may possibly be from the same source as the types. Staudinger compares the insect with *E. glacialis*, to which he says it stands next, but both the genitalia and the neuration are different from those of *glacialis*, and, as Dr. Chapman says, absolutely identical with those of *E. magdalena*, which is only known from the highest mountains of Central Colorado.

I can, in fact, distinguish it specifically from *E. magdalena* only by the brown colour of the disk and inner part of the forewing on both sides, which in *magdalena* are quite black like the rest of the forewing.

The name was first written *erynnis* by Staudinger, but afterwards in a footnote on p. 376 of the same volume changed to *erinna* on account of the similarity of the former spelling with the var. *erynis* of *E. gorge*.

### *Erebia afra*.

This seems to be widely distributed over Southern Russia, and it occurs also in Asia Minor in the Altai Mountains and in the Turcoman country. The form which is isolated in Dalmatia (*dalmata*, Godt.) seems to

be a well marked local variety if not worthy to be treated as a species. Of this I have lately procured a good series taken near Zara by Herr A. Spada, and am able to distinguish them certainly by the much darker colour of the underside, and the much less distinct marking of the veins on the hindwing below; in specimens from other localities these veins are pale grey throughout the wing, but in those from Dalmatia they are only faintly marked in the males, and in the females much less so than in *afra*. The average size also is larger, and the grey colour of the apex of the forewing above is more pronounced than in *afra*.

Christoph says that the specimens he took in the Tekke country belong to this form; but I have seen none from this locality.

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On the two following pages is given the table previously referred to of the known species of *Erebia* and some of the principal varieties arranged so as to present the facts of their geographical distribution in a synoptic form.

JUNE 29, 1889.



